

What is claimed is:

Claims

1. A method comprising:
providing a memory;
5 allocating the memory between a first buffer and a second buffer;
receiving a video signal that includes video data for reconstructing an image;
generating image data representative of the image from the video data;
decoding control data from the video signal that specifies whether the image data is long-
term data or short-term data;
10 storing the image data in the first buffer when the image data is short-term data; and
storing the image data in the second buffer when the image data is long-term data.
2. The method of claim 1 further comprising decoding data from the video signal that
identifies the image data as short-term data or long-term data.
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3. The method of claim 2 further comprising decoding an index from the video signal, when
the image data is long-term data, that specifies a location of the second buffer, and storing the
long-term data in the location.
- 20 4. The method of claim 1 further comprising decoding control data from the video signal
that specifies whether the image data is to be reconstructed from a reference image in a short-
term buffer or a long-term buffer, and selecting a reference image from one of a short-term
buffer or a long-term buffer according to the control data.

5. The method of claim 1 further comprising reconstructing a first portion of the image using a first reference image in a short-term buffer, and reconstructing a second portion of the image using a second reference image in a long-term buffer.

6. The method of claim 1 wherein storing the image data in the first buffer includes at least one of:

storing the image data in a first location that is unused, when an unused location exists; and

storing the image data in a second location that contains a least recently received image data, when no unused location exists.

7. The method of claim 1 wherein the video signal includes a first parameter that specifies that the image data is long-term data and a second parameter that specifies a location of the second buffer where the image data should be stored.

8. The method of claim 1 further comprising decoding from the video signal a new allocation of the memory between one or more short-term buffers and one or more long-term buffers.

9. The method of claim 1 wherein the video signal includes at least one of a block, a group of blocks, a macroblock, or a frame.

10. The method of claim 1 further comprising detecting an error in the video data and signaling the error to an encoder on a back-channel.

11. The method of claim 1 further comprising decoding one or more variable length fields in the video signal.

12. The method of claim 1 wherein the short-term data in the first buffer is stored in a first-in-first-out manner and indexed sequentially.

13. The method of claim 1 wherein the long-term data in the second buffer is stored
5 according to a long-term buffer index included in the video signal.

14. The method of claim 1 further comprising deallocating at least one of the first buffer or the second buffer based upon allocation data decoded from the video signal.

10 15. The method of claim 1 wherein the video data includes differential video data that specifies differences between the image and a reference image.

16. The method of claim 1 wherein the video data is reference data for the image, the reference data being used as the image data.

15 17. A computer program product comprising:
computer executable code for allocating a memory between a first buffer and a second buffer;

20 computer executable code for decoding a video signal that includes video data for reconstructing an image;

computer executable code for generating image data representative of the image from the video data;

computer executable code for decoding control data from the video signal that specifies whether the image data is long-term data or short-term data;

25 computer executable code for storing the image data in the first buffer when the image data is short-term data; and

computer executable code for storing the image data in the second buffer when the image data is long-term data.

18. A video processing system comprising:

a memory;

an allocating means for allocating the memory between a first buffer and a second buffer;

5 a receiving means for receiving a video signal that includes video data for reconstructing an image;

a generating means for generating image data representative of the image from the video data;

10 a decoding means for decoding control data from the video signal that specifies whether the image data is long-term data or short-term data; and

a storing means for storing the image data in the first buffer when the image data is short-term data, and for storing the image data in the second buffer when the image data is long-term data.

15 19. A method comprising:

providing a memory;

allocating the memory between a short-term buffer and a long-term buffer;

storing a long-term reference image in the long-term buffer and a short-term reference image in the short-term buffer;

20 receiving a video signal that includes video data for reconstructing an image;

decoding control data from the video signal that specifies a reference image for reconstructing the image, the reference image being at least one of the short-term reference image or the long-term reference image; and

25 generating image data representative of the image from the video data and the reference image.

20. A method comprising:

providing a memory;

allocating the memory between a short-term buffer and a long-term buffer;
 storing a long-term reference image in the long-term buffer and a short-term reference
 image in the short-term buffer;

receiving a video signal that includes video data for reconstructing an image;

5 decoding first control data from the video signal that specifies a reference image for
 reconstructing the image, the reference image being at least one of the short-term reference
 image or the long-term reference image;

generating image data representative of the image from the video data and the specified
 reference image;

10 decoding second control data from the video signal that specifies a buffer for storing the
 image data, the specified buffer being at least one of a second short-term buffer or a second long-
 term buffer; and

storing the image data in the specified buffer.

15 21. A method comprising:

providing a memory;

allocating the memory between a short-term buffer and a long-term buffer;

storing a long-term reference image in the long-term buffer and a short-term reference
 image in the short-term buffer;

20 receiving a video signal that includes video data for reconstructing an image;

decoding control data from the video signal that specifies a reference image for
 reconstructing the image, the reference image being at least one of the short-term reference
 image or the long-term reference image; and

25 generating image data representative of the image from the video data and the reference
 image.

22. A decoder comprising:

a memory;

a buffer allocation decoder configured to allocate the memory between a long-term buffer and a short-term buffer;

a video input that receives a video signal that includes video data for reconstructing an image;

5 a picture decoder that generates image data representative of the image from the video data; and

an image storage control that decodes control data from the video signal that specifies whether the image data is long-term data or short-term data, and stores the image data in the short-term buffer when the image data is short-term data, and stores the image data in the long-term buffer when the image data is long-term data.

23. A system for video conferencing comprising:

an encoder, the encoder configured to encode differential image data with reference to at least one of a short-term image or a long-term image, and to include in a video signal an indication of a type of reference image data that the differential image data is to be reconstructed with, the type being at least one of referring to a long-term image or a short term image;

a decoder, the decoder configured to decode the differential image data and the indication of the type of the differential image data, and to generate a reconstructed image based upon the differential image data and reference image data in a location specified by the type; and

a video conferencing network that connects the encoder and the decoder in a communicating relationship.

24. The system of claim 23 wherein the encoder and the decoder are configured to communicate a type of the reconstructed image, the decoder storing the reconstructed image in a buffer corresponding to the type.

25. A data signal embodied on a video conferencing carrier wave, the data signal comprising:

a picture identification number assigned sequentially to a picture;
 a flag that indicates whether the data signal includes a number of long-term buffers value;
 a picture property change indicator that indicates a change of image data between short-term data, long-term data, and unused data;

5 a number of buffers for remapping field specifying reallocation instructions;
 a picture buffering mode that signals a way that a current image is to be stored, the way being at least one of as a long-term image or a short-term image; and
 a picture buffer identification that signals a location where a current image is to be stored, the location being at least one of an index for a long-term buffer or an identification number for a

10 short-term buffer.

26. The data signal of claim 25 further comprising a number of long-term buffers value that specifies a maximum number of long-term buffers allowed for use by a decoder receiving the data signal.

15 27. The data signal of claim 25 further comprising address information for changing picture properties, the address information including at least one of a difference of short-term picture identifier specifying a difference between a current short-term picture and a previous short-term picture, or a long-term picture index specifying an index for a long-term buffer.

20 28. The data signal of claim 25 further comprising a long-term/short-term buffer indication, an absolute difference of picture identification, and a sign of difference of the absolute difference.